SEQUENCE LISTING

<110> Geron Corporation
Majumdar, Anish Sen
Ferber, Iris
Frolkis, Maria
Wang, Zhuo

<120> Cancer Vaccines Containing Xenogeneic Epitopes of Telomerase Reverse Transcriptase

<130> 086/002

<140> [to be assigned]
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        595                 600                 605

Cys Arg Leu Arg Phe Ile Pro Lys Pro Asn Gly Leu Arg Pro Ile Val
    610                 615                 620

Asn Met Ser Tyr Ser Met Gly Thr Arg Ala Leu Gly Arg Arg Lys Gln
625                 630                 635                 640

Ala Gln His Phe Thr Gln Arg Leu Lys Thr Leu Phe Ser Met Leu Asn
                645                 650                 655

Tyr Glu Arg Thr Lys His Pro His Leu Met Gly Ser Ser Val Leu Gly
            660                 665                 670
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Met Asn Asp Ile Tyr Arg Thr Trp Arg Ala Phe Val Leu Arg Val Arg
        675                 680                 685

Ala Leu Asp Gln Thr Pro Arg Met Tyr Phe Val Lys Ala Asp Val Thr
    690                 695                 700

Gly Ala Tyr Asp Ala Ile Pro Gln Gly Lys Leu Val Glu Val Val Ala
705                 710                 715                 720

Asn Met Ile Arg His Ser Glu Ser Thr Tyr Cys Ile Arg Gln Tyr Ala
                725                 730                 735

Val Val Arg Arg Asp Ser Gln Gly Gln Val His Lys Ser Phe Arg Arg
            740                 745                 750

Gln Val Thr Thr Leu Ser Asp Leu Gln Pro Tyr Met Gly Gln Phe Leu
        755                 760                 765

Lys His Leu Gln Asp Ser Asp Ala Ser Ala Leu Arg Asn Ser Val Val
    770                 775                 780

Ile Glu Gln Ser Ile Ser Met Asn Glu Ser Ser Ser Ser Leu Phe Asp
785                 790                 795                 800

Phe Phe Leu His Phe Leu Arg His Ser Val Val Lys Ile Gly Asp Arg
                805                 810                 815

Cys Tyr Thr Gln Cys Gln Gly Ile Pro Gln Gly Ser Ser Leu Ser Thr
            820                 825                 830

Leu Leu Cys Ser Leu Cys Phe Gly Asp Met Glu Asn Lys Leu Phe Ala
        835                 840                 845

Glu Val Gln Arg Asp Gly Leu Leu Leu Arg Phe Val Asp Asp Phe Leu
    850                 855                 860

Leu Val Thr Pro His Leu Asp Gln Ala Lys Thr Phe Leu Ser Thr Leu
865                 870                 875                 880

Val His Gly Val Pro Glu Tyr Gly Cys Met Ile Asn Leu Gln Lys Thr
                885                 890                 895

Val Val Asn Phe Pro Val Glu Pro Gly Thr Leu Gly Gly Ala Ala Pro
            900                 905                 910

Tyr Gln Leu Pro Ala His Cys Leu Phe Pro Trp Cys Gly Leu Leu Leu
        915                 920                 925
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Asp Thr Gln Thr Leu Glu Val Phe Cys Asp Tyr Ser Gly Tyr Ala Gln
    930                 935                 940

Thr Ser Ile Lys Thr Ser Leu Thr Phe Gln Ser Val Phe Lys Ala Gly
945                 950                 955                 960

Lys Thr Met Arg Asn Lys Leu Leu Ser Val Leu Arg Leu Lys Cys His
                965                 970                 975

Gly Leu Phe Leu Asp Leu Gln Val Asn Ser Leu Gln Thr Val Cys Ile
            980                 985                 990

Asn Ile Tyr Lys Ile Phe Leu Leu  Gln Ala Tyr Arg Phe  His Ala Cys
        995                 1000                1005

Val Ile  Gln Leu Pro Phe Asp  Gln Arg Val Arg Lys  Asn Leu Thr
    1010                1015                1020

Phe Phe  Leu Gly Ile Ile Ser  Ser Gln Ala Ser Cys  Cys Tyr Ala
    1025                1030                1035

Ile Leu  Lys Val Lys Asn Pro  Gly Met Thr Leu Lys  Ala Ser Gly
    1040                1045                1050

Ser Phe  Pro Pro Glu Ala Ala  His Trp Leu Cys Tyr  Gln Ala Phe
    1055                1060                1065

Leu Leu  Lys Leu Ala Ala His  Ser Val Ile Tyr Lys  Cys Leu Leu
    1070                1075                1080

Gly Pro  Leu Arg Thr Ala Gln  Lys Leu Leu Cys Arg  Lys Leu Pro
    1085                1090                1095

Glu Ala  Thr Met Thr Ile Leu  Lys Ala Ala Ala Asp  Pro Ala Leu
    1100                1105                1110

Ser Thr  Asp Phe Gln Thr Ile  Leu Asp
    1115                1120
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<213> Mesocricetus auratus

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caccaggtgt catcactgaa ggagctggtg gccagggtcg tgcagagact ctgcgagcgc 300

ggcgagagga acgtgctgac ttttggcttc gcgctgctta acggagccca aggcggtcct 360

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<213> Mesocricetus auratus

<400> 6

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Gln Tyr Arg Gln Val Trp Pro Leu Ala Thr Phe Val Arg Arg Leu Gly
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Pro Glu Gly Arg Gln Leu Val Gln Pro Gly Asp Pro Lys Val Phe Arg
35 40 45

Thr Leu Val Ala Arg Cys Leu Val Cys Val Pro Trp Asp Ser Gln Pro
50 55 60

Pro Pro Ala Asp Leu Ser Phe His Gln Val Ser Ser Leu Lys Glu Leu
65 70 75 80

Val Ala Arg Val Val Gln Arg Leu Cys Glu Arg Gly Glu Arg Asn Val
85 90 95

Leu Thr Phe Gly Phe Ala Leu Leu Asn Gly Ala Gln Gly Gly Pro Pro
100 105 110

Met Thr Phe Thr Thr Ser Val Arg Ser Tyr Leu Pro Asn Ser Val Thr
115 120 125

Glu Ser Leu Arg Val Ser Gly Ala Trp Met Leu Leu Leu Asn Arg Val
130 135 140

Gly Asp Asp Leu Leu Val Tyr Leu Leu Ala Arg Cys Ala Leu Tyr Leu
145 150 155 160

Leu Val Pro Pro Ser Cys Ala Tyr Gln Val Cys Gly Ser Pro Leu Tyr
165 170 175

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Gln Ile Cys Ala Thr Ala Glu Thr Trp Pro Ser Val Ser Arg Ile Tyr
            180                 185                 190

Arg Pro Thr Arg Pro Val Gly Arg Asn Phe Thr His Leu Gly Ser Thr
        195                 200                 205

His Arg Val Arg Asn Ser Ser His Gln Glu Ala Trp Lys Pro Pro Pro
    210                 215                 220

Leu Pro Ser Arg Glu Ala Lys Arg Ser Leu Ser Ile Thr Asn Arg Ser
225                 230                 235                 240

Val Pro Pro Ser Lys Lys Ala Arg Cys Asp Leu Ala Pro Arg Leu Glu
                245                 250                 255

Lys Gly Pro Tyr Arg Gln Ala Val Pro Thr Pro Ser Asp Lys Thr Trp
            260                 265                 270

Val Pro Asn Pro Ala Lys Ser His Ala Val Pro Ile Ser Arg Thr Thr
        275                 280                 285

Lys Glu Asp Leu Ser Ser Gly Val Lys Ala Pro Gly Leu Ser Arg Ser
    290                 295                 300

Gly Ser Val Cys Tyr Lys His Lys Pro Ser Ser Thr Ser Leu Gln Ser
305                 310                 315                 320

Pro Leu Cys Gln Asn Ala Phe Gln Leu Arg Pro Tyr Thr Glu Thr Lys
                325                 330                 335

Arg Phe Leu Tyr Ser Arg Glu Gly Gly Arg Glu Arg Leu Asn Pro Ser
            340                 345                 350

Phe Leu Leu Asn Asn Leu Gln Pro Ser Leu Thr Gly Ala Arg Arg Leu
        355                 360                 365

Val Glu Ile Leu Phe Leu Gly Met Arg Pro Arg Thr Ser Gly Pro Leu
    370                 375                 380

Cys Gly Arg Arg Arg Leu Ser Lys Arg Tyr Trp Gln Met Arg Pro Leu
385                 390                 395                 400

Phe Gln Gln Leu Leu Val Asn His Ala Arg Cys Pro Tyr Val Arg Leu
                405                 410                 415

Leu Arg Ser His Cys Arg Phe Arg Thr Ala Ala His Gln Val Ala Gly
            420                 425                 430
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Ala Leu Asn Thr Thr Ser Pro Gln Arg Leu Met Asn Leu Leu Arg Leu
        435                 440                 445

His Ser Ser Pro Trp Gln Val Tyr Gly Phe Leu Gln Ala Cys Val Gly
    450                 455                 460

Lys Leu Val Pro Pro Gly Leu Trp Gly Ser Arg His Asn Gln Arg Arg
465                 470                 475                 480

Phe Phe Lys Asn Val Lys Arg Phe Ile Ser Leu Gly Lys Tyr Asp Lys
                485                 490                 495

Leu Ser Leu Gln Glu Leu Thr Trp Lys Met Lys Val Gln Asp Cys Arg
            500                 505                 510

Trp Leu Arg Ser Ser Pro Gly Asn Asn Cys Val Pro Ala Ala Glu His
        515                 520                 525

Arg Thr Arg Glu Arg Ile Leu Ala Val Phe Leu Phe Trp Leu Met Asp
    530                 535                 540

Ala Tyr Val Val Glu Leu Leu Arg Ser Phe Phe Tyr Val Thr Glu Thr
545                 550                 555                 560

Thr Phe Gln Lys Asn Arg Leu Phe Phe Tyr Arg Lys Ser Met Trp Arg
                565                 570                 575

Arg Leu Gln Ser Ile Gly Val Arg His His Leu Glu Arg Val Arg Leu
            580                 585                 590

Gln Glu Leu Ser Gln Glu Glu Val Arg Gln Arg Gln Glu Ala Trp Pro
        595                 600                 605

Ala Met Pro Ile Cys Arg Leu Arg Phe Ile Pro Lys Pro Ser Gly Leu
    610                 615                 620

Arg Pro Ile Val Asn Met Ser Tyr Met Gly Thr Arg Ala Phe Asp Lys
625                 630                 635                 640

Gly Lys Gln Ala Gln His Phe Thr Gln Cys Leu Lys Thr Leu Phe Ser
                645                 650                 655

Val Leu Asn Tyr Glu Leu Thr Lys His Thr Asn Leu Leu Gly Ala Ser
            660                 665                 670

Val Leu Gly Leu Asn Asp Ile Tyr Arg Thr Trp Arg Thr Phe Val Leu
        675                 680                 685
```

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Arg Val Arg Thr Leu Asp Pro Ala Pro Arg Met Tyr Phe Val Lys Ala
    690                 695                 700

Asp Val Thr Gly Ala Tyr Asp Ala Ile Pro Gln Asp Lys Leu Val Glu
705                 710                 715                 720

Val Ile Ala Asn Met Ile Arg His Pro Asp Asn Ser Tyr Cys Ile His
                725                 730                 735

Gln Tyr Ala Val Val Gln Arg Asp Arg Gln Gly Gln Ile His Lys Ser
            740                 745                 750

Phe Arg Arg Gln Val Ser Thr Leu Ser Asp Leu Gln Pro His Met Gly
        755                 760                 765

Gln Phe Leu Lys His Leu Gln Asp Ser Asp Thr Ser Ala Leu Arg Asn
    770                 775                 780

Ser Val Val Ile Glu Gln Ser Leu Ser Leu Asn Glu Ala Ser Ser Ser
785                 790                 795                 800

Leu Phe Asp Phe Phe Leu Arg Phe Val Arg Asn Ser Val Val Lys Ile
                805                 810                 815

Gly Gly Arg Cys Tyr Val Gln Cys Gln Gly Ile Pro Gln Gly Ser Ser
            820                 825                 830

Leu Ser Thr Leu Leu Cys Ser Leu Cys Phe Gly Asp Met Glu Asn Lys
        835                 840                 845

Leu Phe Ala Glu Val Gln Gln Asp Gly Leu Leu Leu Arg Phe Val Asp
    850                 855                 860

Asp Phe Leu Leu Val Thr Pro His Leu Val Gln Ala Glu Ala Phe Leu
865                 870                 875                 880

Arg Ala Leu Val Arg Gly Ile Pro Glu Tyr Gly Cys Met Ile Asn Leu
                885                 890                 895

Gln Lys Thr Val Val Asn Phe Pro Val Asp Ala Gly Thr Leu Asp Gly
            900                 905                 910

Thr Ala Pro His Gln Leu Pro Ala His Cys Leu Phe Pro Trp Cys Gly
        915                 920                 925

Leu Leu Leu Asp Thr Gln Thr Leu Glu Val Leu Cys Asp Tyr Thr Gly
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930 935 940

Tyr Ala Arg Thr Ser Ile Lys Ala Ser Leu Thr Phe Gln Arg Thr Phe
945 950 955 960

Lys Ala Gly Arg Asn Met Arg Gln Lys Leu Leu Ala Val Leu Arg Leu
965 970 975

Lys Cys His Ser Leu Phe Leu Asp Leu Gln Met Asn Ser Leu Gln Thr
980 985 990

Val Cys Ile Asn Val Tyr Lys Ile Phe Leu Leu Gln Ala Tyr Arg Phe
995 1000 1005

His Ala Cys Ala Leu Gln Leu Pro Phe Asp Gln His Val Arg Lys
1010 1015 1020

Asn Pro Ala Phe Phe Leu Ser Ile Ile Ser Asn Ile Ala Ser Cys
1025 1030 1035

Cys Tyr Ser Ile Leu Lys Val Lys Asn Ala Gly Met Thr Leu Lys
1040 1045 1050

Ala Lys Gly Ala Ser Gly Ser Phe Pro Pro Glu Ala Ala Arg Trp
1055 1060 1065

Leu Cys Tyr Gln Ala Phe Leu Leu Lys Leu Ala Gly His Ser Val
1070 1075 1080

Thr Tyr Lys Cys Leu Leu Gly Pro Leu Arg Thr Ala Gln Lys Gln
1085 1090 1095

Leu Cys Arg Lys Leu Pro Arg Ala Thr Met Ala Ile Leu Glu Thr
1100 1105 1110

Ala Ala Asp Pro Ala Leu Ser Thr Asp Phe Gln Thr Ile Leu Asp
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<212> DNA
<213> Rattus norvegicus

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ctacgggagc tgtcacaaga ggaggtcagg catcaccagg acacctggct agccatgccc 180

atctgcagac tgcgcttcat ccccaagccc aacggcctgc ggcccattgt gaacatgagt 240

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ctcaagactc tcttcagcat gctcaactat gagcggacaa aacatcctca ccttatgggg 360

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<211> 575
<212> PRT
<213> Rattus norvegicus

<400> 8

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Phe Phe Tyr Arg Lys Ser Val Trp Ser Lys Leu Gln Ser Ile Gly Val
            20                  25                  30

Arg Gln His Leu Glu Arg Val Arg Leu Arg Glu Leu Ser Gln Glu Glu
        35                  40                  45

Val Arg His His Gln Asp Thr Trp Leu Ala Met Pro Ile Cys Arg Leu
    50                  55                  60

Arg Phe Ile Pro Lys Pro Asn Gly Leu Arg Pro Ile Val Asn Met Ser
65                  70                  75                  80

Tyr Ser Met Gly Thr Arg Ala Leu Gly Arg Arg Lys Gln Ala Gln His
                85                  90                  95

Phe Thr Gln Arg Leu Lys Thr Leu Phe Ser Met Leu Asn Tyr Glu Arg
            100                 105                 110

Thr Lys His Pro His Leu Met Gly Ser Ser Val Leu Gly Met Asn Asp
        115                 120                 125

Ile Tyr Arg Thr Trp Arg Ala Phe Val Leu Arg Val Arg Ala Leu Asp
    130                 135                 140

Gln Thr Pro Arg Met Tyr Phe Val Lys Ala Asp Val Thr Gly Ala Tyr
145                 150                 155                 160

Asp Ala Ile Pro Gln Gly Lys Leu Val Glu Val Val Ala Asn Met Ile
                165                 170                 175

Arg His Ser Glu Ser Thr Tyr Cys Ile Arg Gln Tyr Ala Val Val Arg
            180                 185                 190

Arg Asp Ser Gln Gly Gln Val His Lys Ser Phe Arg Arg Gln Val Thr
        195                 200                 205

Thr Leu Ser Asp Leu Gln Pro Tyr Met Gly Gln Phe Leu Lys His Leu
    210                 215                 220

Gln Asp Ser Asp Ala Ser Ala Leu Arg Asn Ser Val Val Ile Glu Gln
225                 230                 235                 240

Ser Ile Ser Met Asn Glu Ser Ser Ser Ser Leu Phe Asp Phe Phe Leu
                245                 250                 255
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His Phe Leu Arg His Ser Val Val Lys Ile Gly Asp Arg Cys Tyr Thr
            260                 265                 270

Gln Cys Gln Gly Ile Pro Gln Gly Ser Ser Leu Ser Thr Leu Leu Cys
        275                 280                 285

Ser Leu Cys Phe Gly Asp Met Glu Asn Lys Leu Phe Ala Glu Val Gln
    290                 295                 300

Arg Asp Gly Leu Leu Leu Arg Phe Val Asp Asp Phe Leu Leu Val Thr
305                 310                 315                 320

Pro His Leu Asp Gln Ala Lys Thr Phe Leu Ser Thr Leu Val His Gly
                325                 330                 335

Val Pro Glu Tyr Gly Cys Met Ile Asn Leu Gln Lys Thr Val Val Asn
            340                 345                 350

Phe Pro Val Glu Pro Gly Thr Leu Gly Gly Ala Ala Pro Tyr Gln Leu
        355                 360                 365

Pro Ala His Cys Leu Phe Pro Trp Cys Gly Leu Leu Leu Asp Thr Gln
    370                 375                 380

Thr Leu Glu Val Phe Cys Asp Tyr Ser Gly Tyr Ala Gln Thr Ser Ile
385                 390                 395                 400

Lys Thr Ser Leu Thr Phe Gln Ser Val Phe Lys Ala Gly Lys Thr Met
                405                 410                 415

Arg Asn Lys Leu Leu Ser Val Leu Arg Leu Lys Cys His Gly Leu Phe
            420                 425                 430

Leu Asp Leu Gln Val Asn Ser Leu Gln Thr Val Cys Ile Asn Ile Tyr
        435                 440                 445

Lys Ile Phe Leu Leu Gln Ala Tyr Arg Phe His Ala Cys Val Ile Gln
    450                 455                 460

Leu Pro Phe Asp Gln Arg Val Arg Lys Asn Leu Thr Phe Phe Leu Gly
465                 470                 475                 480

Ile Ile Ser Ser Gln Ala Ser Cys Cys Tyr Ala Ile Leu Lys Val Lys
                485                 490                 495

Asn Pro Gly Met Thr Leu Lys Ala Ser Gly Ser Phe Pro Pro Glu Ala
            500                 505                 510
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Ala His Trp Leu Cys Tyr Gln Ala Phe Leu Leu Lys Leu Ala Ala His
515 520 525

Ser Val Ile Tyr Lys Cys Leu Leu Gly Pro Leu Arg Thr Ala Gln Lys
530 535 540

Leu Leu Cys Arg Lys Leu Pro Glu Ala Thr Met Thr Ile Leu Lys Ala
545 550 555 560

Ala Ala Asp Pro Ala Leu Ser Thr Asp Phe Gln Thr Ile Leu Asp
565 570 575

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<212> DNA
<213> Canis familiaris

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cccaacacgg taaccgagac cctgcgcggc agcggcgcct gggggctgct gctgcgccgc 360

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ccgagctgcg cctaccaggt gtgcgggccg ccgtctacga cctctgcgcc cccgcctctc 480

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tgggagccag aacattccac agagacaaga aggtccagca tctcacctca caactgaaga 1920

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tccctcagga caggctggta gaggtgattg ccaatgtgat caggcctcag gaaagcacat 2160

actgcgtgcg ccactatgcc gtggtccaga ggactgcccg gggacacgtc cgcaaggcct 2220

tcaaaagaca c 2231

<210> 10
<211> 743
<212> PRT
<213> Canis familiaris

<400> 10

Met Pro Arg Ala Pro Arg Cys Arg Ala Val Arg Ala Leu Leu Arg Gly
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Arg Tyr Arg Glu Val Leu Pro Leu Ala Thr Phe Leu Arg Arg Leu Gly
20 25 30

Pro Pro Gly Arg Leu Leu Val Arg Arg Gly Asp Pro Ala Ala Phe Arg
35 40 45

Ala Leu Val Ala Gln Cys Leu Val Cys Val Pro Trp Gly Ala Arg Pro
50 55 60

Pro Pro Ala Ala Pro Cys Phe Arg Gln Leu Ala Phe Gly Phe Ala Leu
65 70 75 80

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Leu Asp Gly Ala Arg Gly Gly Pro Pro Val Ala Phe Thr Thr Ser Val
                85                  90                  95

Arg Ser Tyr Leu Pro Asn Thr Val Thr Glu Thr Leu Arg Gly Ser Gly
            100                 105                 110

Ala Trp Gly Leu Leu Leu Arg Arg Val Gly Asp Asp Val Leu Thr His
        115                 120                 125

Leu Leu Ala Arg Cys Ala Leu Tyr Leu Leu Val Ala Pro Ser Cys Ala
    130                 135                 140

Tyr Gln Val Cys Gly Pro Pro Ser Thr Thr Ser Ala Pro Pro Pro Leu
145                 150                 155                 160

Cys Arg Ser Arg Pro Arg Ser Pro Leu Pro Ala Pro Arg Ser Ala Gly
                165                 170                 175

Arg Ala Arg Asp Leu Arg Pro Thr Arg Gln Ala Arg Thr Arg Pro Ala
            180                 185                 190

Arg Gly Ser Pro Glu Arg Ser Ser Gly Ser Ala Ser Gln Trp Arg Ser
        195                 200                 205

Arg Arg Arg His Arg Pro Ser Gln Ala Thr Ala Pro Val Ala Ser Arg
    210                 215                 220

Val Tyr Thr Cys Arg Ala Leu Pro Gln Leu Ala Trp Glu Gly Gly Pro
225                 230                 235                 240

Pro Asp Ser Ser Asn His Pro Ser Leu Asp Thr Ser Pro Gly Pro Gln
                245                 250                 255

Gly Val Pro His Asp Pro Ala His Pro Glu Thr Lys Arg Phe Leu Tyr
            260                 265                 270

Cys Ser Gly Gly Arg Glu Arg Leu Arg Pro Ser Phe Leu Leu Ser Ala
        275                 280                 285

Leu Pro Pro Thr Leu Gly Ala Arg Lys Leu Val Glu Thr Ile Phe Leu
    290                 295                 300

Gly Ser Ala Pro Gln Lys Pro Gly Ala Ala Arg Arg Met Arg Arg Leu
305                 310                 315                 320

Pro Ala Arg Tyr Trp Arg Met Arg Pro Leu Phe Gln Glu Leu Leu Gly
                325                 330                 335
```

```
Asn His Ala Arg Cys Pro Tyr Arg Ala Leu Leu Arg Thr His Cys Pro
            340                 345                 350

Leu Arg Ala Met Ala Ala Lys Glu Gly Ser Gly Asn Gln Ala His Arg
        355                 360                 365

Gly Val Gly Ile Cys Pro Leu Glu Arg Pro Val Ala Ala Pro Gln Glu
    370                 375                 380

Gln Thr Asp Ser Thr Arg Leu Val Gln Leu Leu Arg Gln His Ser Ser
385                 390                 395                 400

Pro Trp Gln Val Tyr Ala Phe Leu Arg Ala Cys Leu Cys Trp Leu Val
                405                 410                 415

Pro Thr Gly Leu Trp Gly Ser Arg His Asn Gln Arg Arg Phe Leu Arg
            420                 425                 430

Asn Val Lys Lys Phe Ile Ser Leu Gly Lys His Ala Lys Leu Ser Leu
        435                 440                 445

Gln Glu Leu Thr Trp Lys Met Lys Val Arg Asp Cys Thr Trp Leu His
    450                 455                 460

Gly Asn Pro Gly Glu Glu Cys Arg Val Ser Arg Cys Leu Val Gly Leu
465                 470                 475                 480

Gln Glu Gly Pro Gly Ser Gln Pro Glu Cys Gly Arg Pro Leu Pro Pro
                485                 490                 495

Asn His Pro Ser Glu His Pro Phe Leu Cys Trp Ala Gly Ser Asp Cys
            500                 505                 510

Pro Ala Cys Leu Ser Ala Pro Arg Leu Pro Ser Gln Thr Ser Pro His
        515                 520                 525

Pro Gln Arg Leu Pro Gly Cys Pro His Leu Leu Pro Gly Val Met Arg
    530                 535                 540

His His Glu Met Ser Ser Trp Trp Arg Pro Ser Ser Pro Tyr Pro Gly
545                 550                 555                 560

His Thr Trp Leu Leu Ile Gly Cys Ala Pro Gln Leu Phe Asn Ser Val
                565                 570                 575

His Leu Arg Glu Leu Ser Glu Ala Glu Val Arg Arg His Arg Glu Ala
```

580 585 590

Arg Pro Ala Leu Leu Thr Ser Arg Leu Arg Phe Leu Pro Lys Pro Ser
595 600 605

Gly Leu Arg Pro Ile Val Asn Met Asp Tyr Ile Met Gly Ala Arg Thr
610 615 620

Phe His Arg Asp Lys Lys Val Gln His Leu Thr Ser Gln Leu Lys Thr
625 630 635 640

Leu Phe Ser Val Leu Asn Tyr Glu Arg Ala Arg Arg Pro Ser Leu Leu
645 650 655

Gly Ala Ser Met Leu Gly Met Asp Asp Ile His Arg Ala Trp Arg Thr
660 665 670

Phe Val Leu Arg Ile Arg Ala Gln Asn Pro Ala Pro Gln Leu Tyr Phe
675 680 685

Val Lys Val Asp Val Thr Gly Ala Tyr Asp Ala Leu Pro Gln Asp Arg
690 695 700

Leu Val Glu Val Ile Ala Asn Val Ile Arg Pro Gln Glu Ser Thr Tyr
705 710 715 720

Cys Val Arg His Tyr Ala Val Val Gln Arg Thr Ala Arg Gly His Val
725 730 735

Arg Lys Ala Phe Lys Arg His
740

<210> 11
<211> 2855
<212> DNA
<213> Homo sapiens

<400> 11
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cccaggtgtc tctgaagagc tggtggccgg ttgcagagct ctgcgagcgc cggaaacgtg 240

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cgcagctacc tgcccaacac ggtacgagcc tgcggcaggg gctgggctct gctggccggt 360

gggcgacgac tgctggtcac ctgctggccg ctggcgctta ctgctggtgc ccagctggcc 420

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gggataacgc gacgagtcca ggagcagaac cccggcctgc cactcgggcg aggggcggcc 540

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gtccaagtcg tccgggtgcc tccgaaagtc ttggaggctg ccgagtcctc tcgtggcaac 660

acagccgtcc acatcgcgtc accaccccaa gctcacccat acgagaccaa accttcctct 720

actccgaggt ggcgagcggc tgcccctctt cctactcagc cctgcgccac tgactggggc 780

cggagactgt ggagacatct ttctgggctc aggccggaca ggcccgcagg acccgcctcc 840

gctactggca atgcggcccc tgttccagag ctgcttggaa ccagccgtgc cctaggctcc 900

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cgcacagcag ccctggcagg ttatggcttc tcgggcctgc tgcgctggtg cccggctctg 1020

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aagcttcctg caggactgac gtggaagatg aagtcggact gctggctcgc agagcccagg 1140

gagactgtgt ccggctgcag agcaccgcga ggagaggatc ctggctgttc ctgctggctg 1200

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aacaggctct tcttctaccg aagagtgtgt ggagcaagct gcagagcatt ggagtcaggc 1320

aacaccttga gagagtgcgg ctacgggagc tgtcacaaga agaggtcagg cacaccagga 1380

gcctggccag ccatgcccat ctgcagactg cgcttcatcc ccaagcccaa cggctgcggc 1440

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gctcaagctg gctgtcattc tgtcactaca atgtctcctg ggacctctag gacagcccaa 2760

aaacgctgtg ccggaagctc ccagggcgac aatgaccatc cttagctgca gctgacccag 2820

ccctaagcac agactttcag accattttgg actaa 2855

<210> 12
<211> 1152
<212> PRT
<213> Homo sapiens

<400> 12

Met Pro Arg Ala Pro Arg Cys Arg Ala Val Arg Ala Leu Leu Arg Ser
1 5 10 15

His Tyr Arg Glu Val Leu Pro Leu Ala Thr Phe Val Arg Arg Leu Gly
20 25 30

Pro Glu Gly Arg Arg Leu Val Gln Pro Gly Asp Pro Ala Ala Phe Arg
35 40 45

Ala Leu Val Ala Gln Cys Leu Val Cys Val Pro Trp Gly Ala Arg Pro
50 55 60

Pro Pro Ala Ala Pro Ser Phe His Gln Val Ser Ser Leu Lys Glu Leu
65 70 75 80

Val Ala Arg Val Val Gln Arg Leu Cys Glu Arg Gly Glu Arg Asn Val
85 90 95

Leu Ala Phe Gly Phe Ala Leu Leu Asp Gly Ala Arg Gly Gly Pro Pro
100 105 110

Met Ala Phe Thr Thr Ser Val Arg Ser Tyr Leu Pro Asn Thr Val Thr
115 120 125

Glu Thr Leu Arg Gly Ser Gly Ala Trp Gly Leu Leu Leu Arg Arg Val
130 135 140

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Gly Asp Asp Leu Leu Val His Leu Leu Ala Arg Cys Ala Leu Tyr Leu
145                 150                 155                 160

Leu Val Ala Pro Ser Cys Ala Tyr Gln Val Cys Gly Pro Pro Leu Tyr
                165                 170                 175

Gln Ile Gly Ala Thr Thr Gln Ala Arg Pro Pro Pro His Ala Ser Gly
            180                 185                 190

Arg Pro Arg Arg Pro Val Gly Arg Asn Phe Thr Asn Leu Gly Phe Cys
        195                 200                 205

Glu Arg Ala Trp Asn His Ser Val Arg Glu Ala Gly Val Pro Leu Gly
    210                 215                 220

Leu Pro Ser Pro Gly Ala Lys Arg Arg Gly Gly Ser Ala Ser Arg Ser
225                 230                 235                 240

Leu Pro Leu Pro Lys Lys Ala Arg Arg Gly Ala Ala Pro Glu Pro Glu
                245                 250                 255

Arg Thr Pro Val Gly Gln Gly Ser Trp Thr Pro Ser Gly Arg Thr Arg
            260                 265                 270

Val Pro Ser Asp Ala Gly Ser Pro Val Val Ser Pro Ala Arg Pro Ala
        275                 280                 285

Glu Glu Asp Leu Ser Ser Lys Gly Lys Val Ser Asp Leu Ser Leu Ser
    290                 295                 300

Gly Ser Val Cys Cys Lys His Lys Pro Ser Ser Pro Pro Ser Leu Ser
305                 310                 315                 320

Ser Pro Pro Arg Pro Asn Ala Phe Gln Leu Arg Pro Val Tyr Ala Glu
                325                 330                 335

Thr Lys His Phe Leu Tyr Ser Ser Gly Gly Arg Glu Arg Leu Arg Pro
            340                 345                 350

Ser Phe Leu Leu Ser Asn Leu Gln Pro Ser Leu Thr Gly Ala Arg Arg
        355                 360                 365

Leu Val Glu Thr Ile Phe Leu Gly Ser Arg Pro Trp Thr Ser Gly Pro
    370                 375                 380

Leu Cys Arg Thr His Arg Leu Ser Arg Arg Tyr Trp Gln Met Arg Pro
385                 390                 395                 400
```

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Leu Phe Gln Glu Leu Leu Gly Asn His Ala Arg Cys Pro Tyr Val Arg
                405                 410                 415

Leu Leu Arg Ser His Cys Pro Leu Arg Ala Ala Ala Thr Pro Val Ala
            420                 425                 430

Gly Ala Leu Asn Thr Ser Pro Pro Gln Gly Ser Val Ala Ala Pro Glu
        435                 440                 445

Glu Val Ala Ala Pro Gln Glu Gln Thr Asp Ser Thr Arg Leu Met Gln
    450                 455                 460

Leu Leu Arg Gln His Ser Ser Pro Trp Gln Val Tyr Gly Phe Leu Arg
465                 470                 475                 480

Ala Cys Leu Cys Lys Leu Val Pro Pro Gly Leu Trp Gly Ser Arg His
                485                 490                 495

Asn Glu Arg Arg Phe Leu Lys Asn Val Lys Lys Phe Ile Ser Leu Gly
            500                 505                 510

Lys His Ala Lys Leu Ser Leu Gln Glu Leu Thr Trp Lys Met Lys Val
        515                 520                 525

Arg Asp Cys Ala Trp Leu Arg Ser Ser Pro Gly Tyr Glu Ser Val Pro
    530                 535                 540

Ala Ala Glu His Arg Leu Arg Glu Arg Ile Leu Ala Lys Glu His Pro
545                 550                 555                 560

Phe Leu Phe Trp Leu Met Ser Val Tyr Val Val Glu Leu Leu Arg Ser
                565                 570                 575

Phe Phe Tyr Ile Thr Glu Ser Thr Phe Gln Lys Asn Arg Leu Phe Phe
            580                 585                 590

Tyr Arg Lys Ser Val Trp Ser Lys Leu Gln Ser Ile Gly Val Arg Gln
        595                 600                 605

His Leu Glu Arg Val Arg Leu Arg Glu Leu Ser Gln Glu Glu Val Arg
    610                 615                 620

Gln His Gln Glu Ala Trp Pro Ala Met Pro Ile Cys Arg Leu Arg Phe
625                 630                 635                 640

Ile Pro Lys Pro Asn Gly Leu Arg Pro Ile Val Asn Met Ser Tyr Ser
                645                 650                 655
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Met Gly Thr Arg Ala Phe Gly Arg Arg Lys Gln Ala Gln His Phe Thr
660 665 670

Gln Arg Leu Lys Thr Leu Phe Ser Val Leu Asn Tyr Glu Arg Thr Lys
675 680 685

His Pro His Leu Leu Gly Ala Ser Val Leu Gly Met Asn Asp Ile Tyr
690 695 700

Arg Thr Trp Arg Thr Phe Val Leu Arg Val Arg Ala Leu Asp Pro Thr
705 710 715 720

Pro Arg Met Tyr Phe Val Lys Ala Asp Val Thr Gly Ala Tyr Asp Ala
725 730 735

Ile Pro Gln Asp Lys Leu Val Glu Val Ile Ala Asn Met Ile Arg His
740 745 750

Ser Glu Ser Thr Tyr Cys Ile Arg Gln Tyr Ala Val Val Gln Arg Asp
755 760 765

Ala Gln Gly Gln Val His Lys Ser Phe Arg Arg Gln Val Ser Thr Leu
770 775 780

Ser Asp Leu Gln Pro Tyr Met Gly Gln Phe Leu Lys His Leu Gln Asp
785 790 795 800

Ser Asp Ala Ser Ala Leu Arg Asn Ser Val Val Ile Glu Gln Ser Ile
805 810 815

Ser Leu Asn Glu Ala Ser Ser Ser Leu Phe Asp Phe Phe Leu Arg Phe
820 825 830

Leu Arg His Ser Val Val Lys Ile Gly Gly Arg Cys Tyr Val Gln Cys
835 840 845

Gln Gly Ile Pro Gln Gly Ser Ser Leu Ser Thr Leu Leu Cys Ser Leu
850 855 860

Cys Phe Gly Asp Met Glu Asn Lys Leu Phe Ala Glu Val Gln Arg Asp
865 870 875 880

Gly Leu Leu Leu Arg Phe Val Asp Asp Phe Leu Leu Val Thr Pro His
885 890 895

Leu Asp Gln Ala Lys Thr Phe Leu Ser Thr Leu Val Arg Gly Val Pro

900 905 910

Glu Tyr Gly Cys Met Ile Asn Leu Gln Lys Thr Val Val Asn Phe Pro
915 920 925

Val Glu Pro Gly Thr Leu Gly Gly Thr Ala Pro Tyr Gln Leu Pro Ala
930 935 940

His Cys Leu Phe Pro Trp Cys Gly Leu Leu Leu Asp Thr Gln Thr Leu
945 950 955 960

Glu Val Phe Cys Asp Tyr Ser Gly Tyr Ala Arg Thr Ser Ile Lys Ala
965 970 975

Ser Leu Thr Phe Gln Arg Val Phe Lys Ala Gly Lys Asn Met Arg Asn
980 985 990

Lys Leu Leu Ser Val Leu Arg Leu Lys Cys His Ser Leu Phe Leu Asp
995 1000 1005

Leu Gln Val Asn Ser Leu Gln Thr Val Cys Ile Asn Ile Tyr Lys
1010 1015 1020

Ile Phe Leu Leu Gln Ala Tyr Arg Phe His Ala Cys Val Ile Gln
1025 1030 1035

Leu Pro Phe Asp Gln Arg Val Arg Lys Asn Pro Thr Phe Phe Leu
1040 1045 1050

Gly Ile Ile Ser Ser Gln Ala Ser Cys Cys Tyr Ala Ile Leu Lys
1055 1060 1065

Val Lys Asn Ala Gly Met Thr Leu Lys Ala Lys Gly Ala Ala Gly
1070 1075 1080

Ser Phe Pro Pro Glu Ala Ala His Trp Leu Cys Tyr Gln Ala Phe
1085 1090 1095

Leu Leu Lys Leu Ala Ala His Ser Val Thr Tyr Lys Cys Leu Leu
1100 1105 1110

Gly Pro Leu Arg Thr Ala Gln Lys Gln Leu Cys Arg Lys Leu Pro
1115 1120 1125

Glu Ala Thr Met Thr Ile Leu Glu Ala Ala Ala Asp Pro Ala Leu
1130 1135 1140

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Ser Thr  Asp Phe Gln Thr Ile  Leu Asp
    1145                1150
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